

REMARKS

Claims 5 and 7-13 are pending in this application.

Claims 7 and 11 have been amended and new claims 12-13 have been added to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. Claim 5 has been withdrawn from consideration.

The specification has been amended to correct several minor errors.

The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **March 12, 2004**.

In view of the claims as amended, the new claims and remarks set forth below, further and favorable consideration is respectfully requested.

I. Claims 7-11 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The Examiner states that the specification does not support "0.03". Responsive to this rejection, claim 7 has been amended to correctly recite "0.13" in place of the typographical error (0.03).

II. Claims 7, 8 and 11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. "Study of Resistance Against Photorefractive Light-Induced Scattering in LiNbO₃:Fe, Mg Crystals".

The Examiner states that it would have been obvious to the skilled artisan to meet the stoichiometric values of the congruent composition, because Zhang clearly teaches that when a LiNbO₃:Fe composition is doped with magnesium, indium or zinc as a three-dimensional optical storage material, the Mg concentration is 4.6 mol%. Claim 7 has been amended to require a response

time of from 3 to 5 seconds.

New claims 12 and 13 correspond to claims 9 and 10 (which were indicated allowable) rewritten in independent form.

Zhang discloses $\text{LiNbO}_3\text{:Fe, Mg}$ and $\text{LiNbO}_3\text{:Fe, Zn}$ crystals. Mg is present in an amount of from 2.0 to 6.0 mol%. Zhang does not disclose $\text{LiNbO}_3\text{:Fe, In}$.

In view of the following, this rejection is respectfully overcome.

When writing photorefractive grating, the present crystals have high diffraction efficiencies (more than 68%), fast response speeds of photorefraction (3~5 sec), and high resistance to optical scattering. When the diffraction efficiency of the Zhang crystals reach the value of the present crystals, the response time of their crystals is more than 35 sec, which is one order of magnitude longer than that of the present crystals. The fastest response time of the crystals of Zhang et al. is 15 sec, which is 3~5 times longer than that of the present crystals. In that time, the diffraction efficiency of the Zhang crystals is just about 15%, which is more than 4 times smaller than that of the present crystals. Therefore, the present crystals achieve superior results as compared to the results achieved by Zhang et al.

Zhang does not disclose that M is Mg, Zn or In, and does not write the crystal as " $\text{LiNbO}_3\text{:Fe,M}$."

Zhang discloses 4.6 mol% Mg, but this concentration is the threshold that the photorefractive damage resistance of MgO doped LiNbO_3 crystals could be improved greatly. Zhang does not disclose the use of such crystals for photorefractive optical storage.

Though Zhang discloses that $\text{LiNbO}_3:\text{Fe,Mg}$ can be used as a three-dimensional optical storage material, the photorefractive response time of Zhang's crystals are *one order of magnitude larger* than that of the present crystals. Zhang does not teach or suggest a response time of from 3 to 5 seconds, as presently required.

Zhang only studies $\text{LiNbO}_3:\text{Fe,Mg}$ crystals, and in the last sentence of their paper, they just mention $\text{LiNbO}_3:\text{Fe,Zn}$. Accordingly, Zhang does not teach a $\text{LiNbO}_3:\text{Fe}$ doped with a three-dimensional optical storage material.

In view of the above, it is submitted that nothing in Zhang does not teach or suggest a response time of from 3 to 5 seconds, and that renders the claimed invention obvious within the meaning of 35 U.S.C. §103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

In view of the aforementioned amendments and accompanying remarks, claims 7 and 11, as amended, are in condition for allowance, which action, at an early date, is requested.

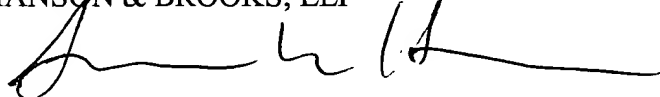
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 09/881,836
Response dated June 14, 2004
Reply to OA of **March 12, 2004**

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP



Susanne M. Hopkins
Attorney for Applicant
Reg. No. 33,247

SMH/nrp
Atty. Docket No. **010737**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



23850

PATENT TRADEMARK OFFICE

Q:\FLOATERS\shopkins\01\010737\06-04 Amend